

THE HEALTH SCIENCES CAREERS PROGRAM

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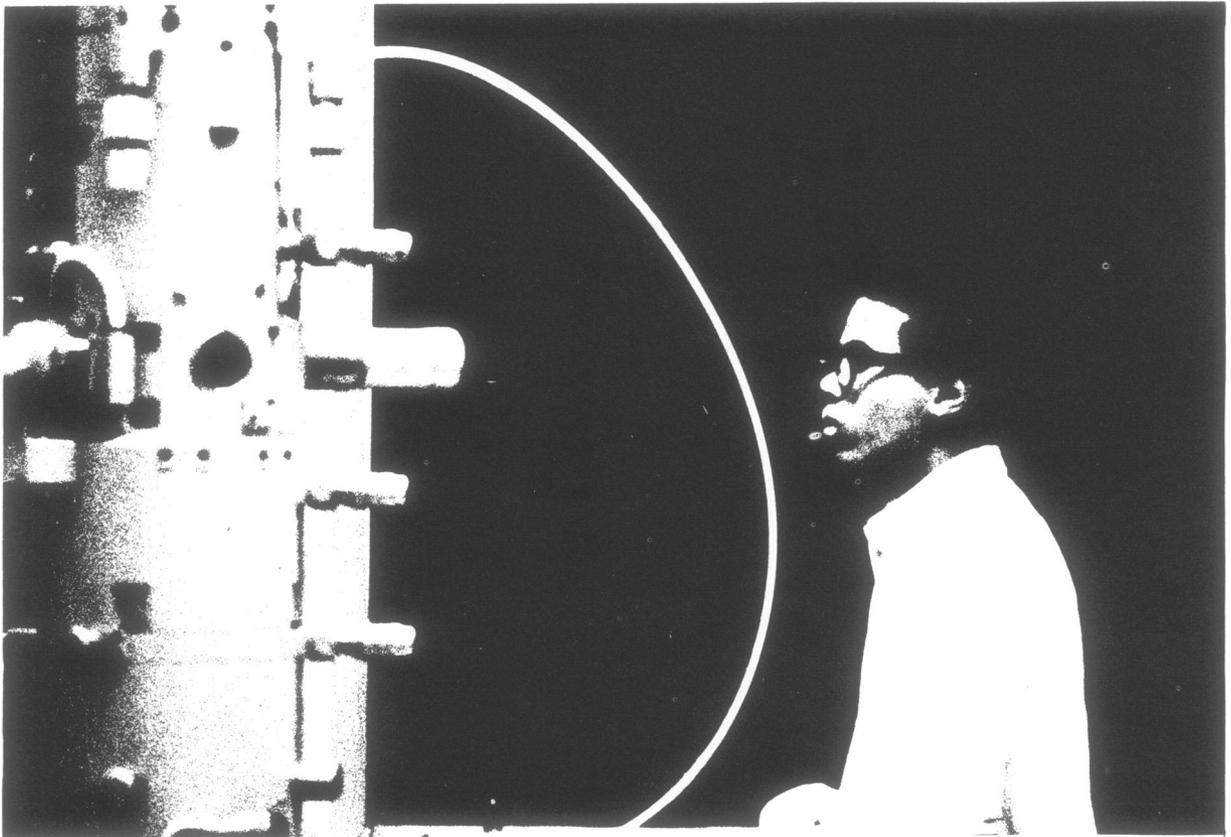
The Center for Allied Health Careers of the Johns Hopkins Medical Institutions and several Baltimore high schools operate a variety of programs under the overall title of the Health Sciences Careers Program (HSCP). Individual student participation ranges from occasional observations in hospitals by 10th graders to the development of immediately marketable health care skills by high school seniors. The objectives of the programs are to prepare students to function satisfactorily as employees in the health care system; to select an appropriate health care occupation; to continue in an advanced education or training program or be employed in an allied health occupation, or both; or to become a more knowledgeable consumer of health care services.

These programs, with 150 participants during the school year and 400 during the summer, necessitate a great deal of interagency cooperation.

Different participating groups within the coalition hosted by Johns Hopkins are concerned with student recruitment and selection, curriculum design, design of learning environment, student salary stipends, professional evaluation, college counseling and financial aid, and management training.

The program seems to be meeting its objectives. For example, one particular program removes its students from the traditional school setting to spend the full day, 5 days a week, in the hospital for the entire academic year. These high school seniors spend half a day in on-the-job training and the other half learning English, mathematics, and sciences as they apply to health care. The environment is an open classroom within the hospital, and the teaching is conducted by carefully selected public school teachers.

The primary admission requirement of this program is poverty. The second requirement is that the students must be enrolled in a general rather than an academic or a vocational curriculum. Preliminary research indicates that the new recruits from the "general curriculum" have little orientation to an occupational or educational goal when they enter the program. After graduation, however, they exhibit rising occupational aspirations and a new degree of motivation for higher education. A significant number of graduates from the original group in this particular program have been employed in responsible positions at the Johns Hopkins complex, while others have gone on to college. Program participants continue their



education at twice the rate of high school graduates from the city at large.

In this paper we describe how a variety of health sciences career programs came to be, how they might be duplicated by other institutions, and the interorganizational cooperation necessary for the program's success.

Background

Recent statements by the U.S. Commissioner of Education and others suggest that career education is of the highest national priority. At the Johns Hopkins Medical Institutions, health career education has received top priority for many years; in fact, the effort has been carried deliberately into the high schools.

In 1966, Dr. David A. Levy, an allergist deeply committed to the principles of equal education and employment opportunities, initiated the Health Sciences Careers Program. Originally, his program provided part-time summer employment in the hospital for high-potential, high school students of the East Baltimore community, an inner city, black neighborhood. Acting independently, Levy obtained 25 work-study stipends from among the budgets of his fellow researchers.

The immediate goals of the HSCP were to secure entry into the health care system for promising black students, to teach marketable skills, and to provide financially sustaining employment. The longer term goals were to promote good work habits, to awaken and develop abilities and talents, to motivate the students to seek higher education leading to careers in the health care system, and to create health career ladder lattices.

Eventually, the summer HSCP grew to include classroom instruction and cultural enrichment to supplement the on-the-job training, which was its cornerstone. The classroom instruction emphasized the skills needed for job performance and frequently emphasized remedial English, mathematics, and general science. Cultural enrichment included trips to museums, theaters, and concerts, which, it was believed, enhanced the morale of the students.

By 1968 and 1969, the HSCP had grown to include a year-round, after-school component, and its reputation gained in stature. The staff of the U.S. Office of Education's ES-70 (Educational Systems for the Seventies) curriculum design project became interested in the program. The U.S. Department of Labor's Neighborhood Youth

Relationships of programs and agencies participating in the Health Sciences Careers Program

Program title	Implementing agencies	Funding—student stipends	Primary purposes of program
Dunbar Medi-Schools...	Baltimore City Public Schools and Johns Hopkins.	U.S. Department of Labor, Neighborhood Youth Corps.	A curriculum design project emphasizing individualized instruction as part of the U.S. Office of Education nationwide ES-70 project, that is, needs for teacher retraining and fitting the curriculum to the needs of the school population.
School Without a Building.....	Baltimore City Public Schools and Johns Hopkins.	U.S. Department of Labor, Neighborhood Youth Corps.	To capitalize on the impact of out-of-school environments on learning, performance, and attitudes, particularly one's self-concept, and employer-employee relations.
Health Sciences Careers Program After-School and Summer Program.	Johns Hopkins and Maryland State Department of Education.	U.S. Department of Labor, Neighborhood Youth Corps.	To invest the student with marketable skills by on-the-job training and to encourage the student to pursue continuing education or training in health-related fields.
Neighborhood Youth Corps In-School Program	Johns Hopkins and Neighborhood Youth Corps.	U.S. Department of Labor, Neighborhood Youth Corps.	To provide gainful employment in a medically oriented environment with the hope that the person will continue in health career education.
Neighborhood Youth Corps Out-of-School Program.....	Johns Hopkins, Community Action Agency, and Neighborhood Youth Corps.	U.S. Department of Labor, Neighborhood Youth Corps.	To provide on-the-job training to high school dropouts and to supplement that training with individualized instruction by teachers provided through the Community Action Agency.
Baltimore City Public Schools Job-Oriented Programs	Baltimore City Public Schools Office of Guidance and Counseling.	None.....	Recruitment and selection of candidates from among citywide students interested in participation in the summer Health Sciences Careers Program. The other programs sometimes recruit their year-round participants from among the 400 summer participants.
Direct Search for Talent	U.S. Office of Education.	None.....	Johns Hopkins refers high-potential poverty students to this U.S. Office of Education-supported agency for counseling and financial aid to facilitate their admission to colleges.
Training Now for Tomorrow.....	Private philanthropy.....	None.....	A privately developed effort to get poverty students into prestige colleges.
College Intern Program..	Baltimore Mayor's Office.	U.S. Office of Economic Opportunity	The Baltimore Mayor's Office effort to secure temporary jobs in municipally oriented agencies for college students interested in urban affairs.

Corps, a mechanism for providing work-study stipends to students of high school age from low income families, began to carry the payroll which had previously been handled through the various hospital departments.

The Programs

By fall 1970, five high school level programs were operating under the umbrella of the Health Sciences Careers Program at the Johns Hopkins complex—the Dunbar Medi-School, the School Without a Building, the HSCP After-School Program, the Neighborhood Youth Corps In-School

Program, and the Neighborhood Youth Corps Out-of-School Program.

The school-year programs have 150–200 participants and the combined summer programs, more than 400. With the numbers swelling to such large totals, it was not surprising that resources were shared with other service institutions and auxiliary programs. Subsequently, the high school programs became a confederation of cooperating efforts (see table) which were coordinated by Johns Hopkins as follows:

Dunbar Medi-School. The Medi-School operates in the Johns Hopkins Hospital and in the Paul Laurence Dunbar High School, two blocks away.

The purpose of the Medi-School is to modify the standard high school curriculum to fit the needs of the participants, to add a strong health careers component, to train teachers to relate classroom subjects to occupational experiences, and to invest the curriculum with more individualized instruction. As a result, a higher degree of flexibility within all the high school curriculums can be expected.

About 50 seniors are attending the Medi-School, now in its second year. They receive instruction from selected teachers at Dunbar High School each morning and on-the-job training from a professional at a particular job in the hospital in the afternoon. The student usually retains his hospital assignment, such as laboratory assistant or patient-care assistant, throughout the school year.

Plans call for gradually extending the program into the junior and sophomore classes through introductory lectures and tours. When fully operational, the Medi-School will enable about 100 sophomores to receive occasional exposure to hospital procedures. From this group, a self-selection process is expected to produce about 75 juniors who will receive a more intensive set of experiences in the hospital. In their senior year, 50 selected students will receive extended on-the-job training and related classroom learning as described.

School Without a Building. The School Without a Building was initiated in 1970-71 by a grant from the Rockefeller Foundation, and the cost was subsequently assumed by the Baltimore City Public Schools. Modeled as a vocational education pilot project to assess the impact of "out of school" environments on learning and performance at the high school level, the program consists of six separate training components functioning simultaneously: baking, banking, retailing, carpentry, data processing, and health careers. Each student remains for the entire academic year within the occupational element he chooses, thus spending his senior year outside his high school.

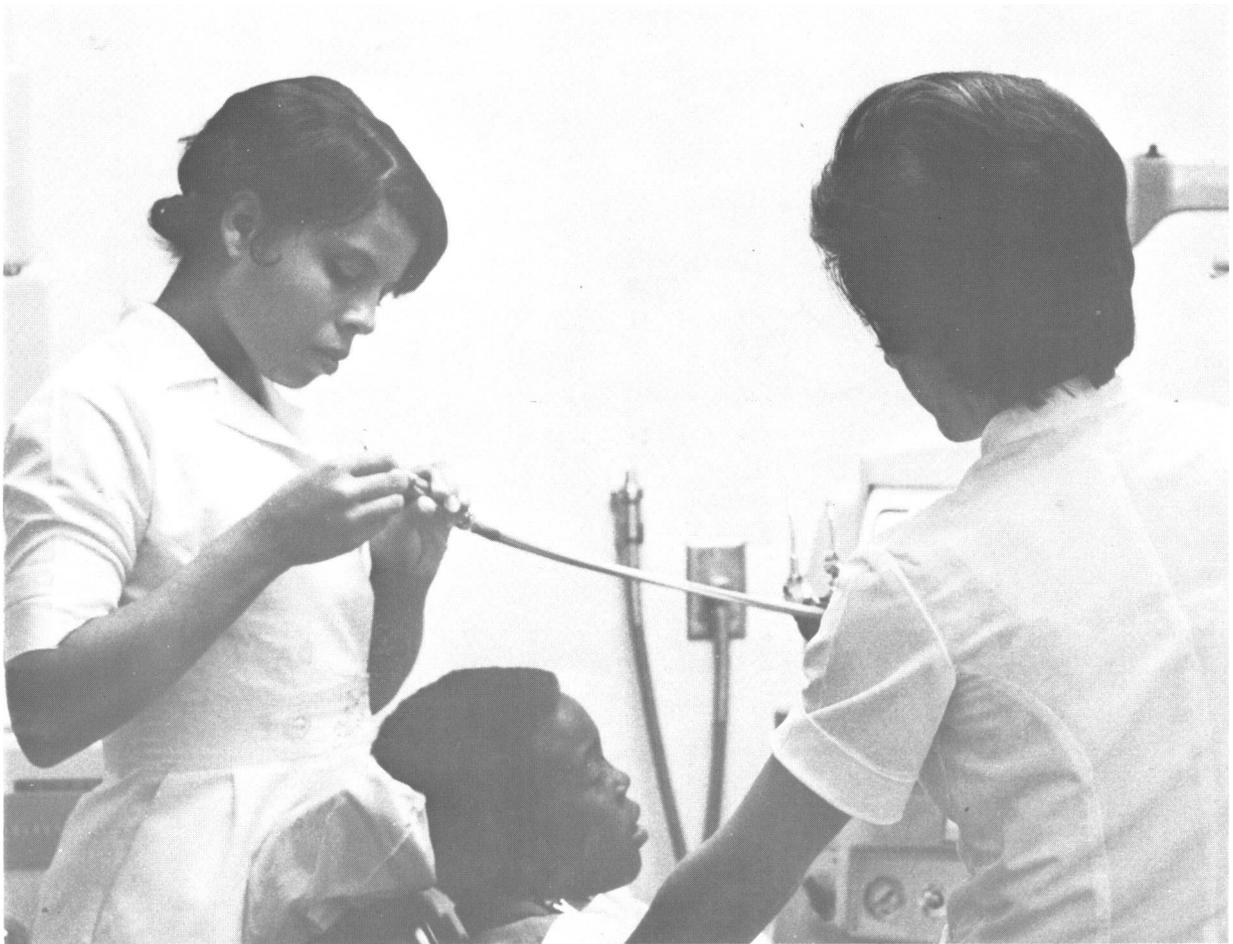
The health careers component of the School Without a Building is hosted by the Johns Hopkins Hospital. Thirty-six seniors spend their mornings, 5 days a week, at a selected work station in the hospital where they receive on-the-job training; in the afternoons they receive group instruction in an "open classroom" in the hospital by a rotating corps of teachers selected from the school system. More specifically, each morning the students receive on-the-job training from profession-

als within the departments of radiology, pharmacy, childlife, laboratory medicine, and occupational therapy. In the afternoon, they receive classwork in English, mathematics, and science, including social science. As much as possible, the teachers relate course work to the field of health care. For example, the mathematics teacher may stress the metric system and solution-dilution, the social science teacher might have the students debate the issues of national health insurance. Some high school juniors and sophomores are now observing at selected work stations, with plans for their increased involvement in the future.

HSCP After-School Program. The Health Sciences Careers Program After-School Program emphasizes on-the-job training during after-school hours and on weekends. It is similar to the Medi-School and the School Without a Building in that it teaches students marketable health care skills. It differs in that it does not carry any contiguous classroom work relating to the on-the-job training experience. The participants attend various Baltimore high schools all day, and they are enrolled in various curriculums. They may arrange to be at their work stations during their free time for on-the-job training as surgical assistants or laboratory research assistants. The summer HSCP has greater resources and provides a more comprehensive program with administrative support from the Maryland State Department of Education.

Neighborhood Youth Corps Programs. The U.S. Department of Labor's Neighborhood Youth Corps is a funding mechanism which provides student work-study salary stipends through implementing agencies such as the Medi-School, the School Without a Building, and the Health Sciences Careers Program. Probably no single force has had more effect on the entry of disadvantaged, high-potential students into the health care system. Since 1968, thousands of dollars were paid to NYC enrollees at Johns Hopkins. In recent tight-money times, this funding has been especially helpful, because few departmental work-study stipends are available. Moreover, reports from the professional staff of the hospital suggest that the NYC students have come to be an effective vacation-relief work force.

The students are motivated by their salaries (\$1.60 an hour) to have good attendance, which is significant in scheduling research or patient care responsibilities. Since many live nearby, they have few transportation problems and are able to work



Attaching brush to dental drill

split-shifts and weekends, thus allowing continuity in training and supervision, gradually increasing responsibilities, and hence continuity of care for the patient.

Additionally, the Neighborhood Youth Corps provides work-study stipends for two other programs, the NYC In-School Program and the NYC Out-of-School Program.

NYC In-School Program. Having no contiguous classroom work, this program emphasizes introductory work experience for high school students at departments within the Johns Hopkins complex, such as laundry, nutrition, bookkeeping, housekeeping, and buildings, maintenance, and grounds. Because 40 percent of the employees of the complex are in these departments, this group of students (coincidentally totaling 40 percent of the students in the Johns Hopkins' NYC programs) are also members of the health care team. The program attempts to invest dignity into these important roles, which the more glamorous re-

search and clinical roles usually preempt. The goal of this program is to provide gainful employment in an environment where exposure to the general field of health care will, it is hoped, result in continuing education related to health care.

NYC Out-of-School Program. This program provides training and education for high school dropouts recruited by the Community Action Agency. The program has enjoyed an excellent working relationship with the hospital since it began in 1966. Many of the enrollees who were trained at the hospital are now full-time employees. Similar to the School Without a Building, the 26 enrollees receive on-the-job training in the afternoon and course work in the morning from teachers from the Community Action Agency rather than from public school teachers. The work is highly individualized, geared to preparing the student for the high school equivalency examinations. The work-study stipends are again paid by the Neighborhood Youth Corps. The success of



Unit clerk teaches student charting procedures and other skills

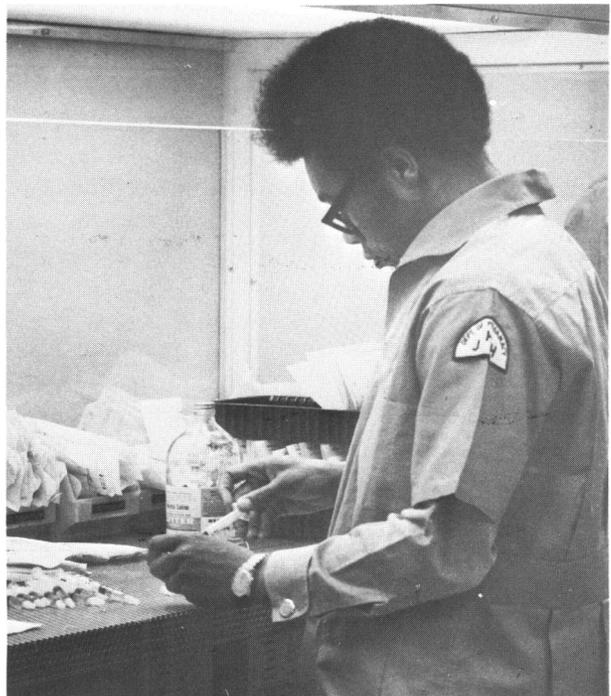


Learning how an X-ray film processing machine works

the program suggests an investment of similar efforts for the rehabilitation of selected juvenile offenders.

BCPS Job-Oriented Programs. The Baltimore City Public Schools' Office of Guidance and Counseling has a Job Development Program which seeks to place high school graduates directly into jobs. The central office performs the auxiliary function of recruiting and screening applicants; it sends applications to its job-placement counselors at each high school in the city for interested and highly recommended students. The applications are centrally collected and reviewed by the administrators of the programs described and the Johns Hopkins staff. Students whose family incomes meet the requirements are then processed by the Neighborhood Youth Corps and admitted into the programs. Thus the school system plays a part in recruiting and screening.

Direct Search for Talent. Initiated by the service sorority Delta Sigma Theta, this program is an effort of the U.S. Office of Education to provide counseling and financial aid to promising poor students who are seeking higher education. It is par-



Learning the use of syringes, student draws normal saline solution into hypodermic syringe



Student pipets solution from beaker in research project on mice

ticularly effective in securing fee waivers for college board examinations, for parents' confidential financial statements, and for applications—fees which could amount to well over \$100 for the student applying to more than one school. Direct Search for Talent also keeps tabs on recruitment policy for blacks at various schools, black student associations, remedial tutoring facilities, transportation, and housing costs. The program has been most effective in placing outstanding young persons at the “better colleges.” This program is a welcome auxiliary resource for the interested and motivated students assigned to Johns Hopkins through the other programs.

Training Now for Tomorrow. This is a privately supported effort which seeks to maintain contacts with the “prestige” schools. Training Now for Tomorrow serves the same functions as Direct Search for Talent, with the added attraction of visits to the campuses of prospective colleges. Needless to say, it serves a relatively small number of students. Johns Hopkins' coordination with this program is similar to its coordination with Direct Search for Talent.

College Intern Program. The Baltimore Urban Corps, in the Mayor's office, operates a program for obtaining positions with municipal agencies for college students interested in various aspects of urban management. As the Health Sciences Careers Program works so closely with the school system, the Baltimore City Public Schools stations a college student intern with the summer HSCP. This student serves a multifaceted role. First, as an intern, he helps to keep track of the 400 students—where they are stationed, for whom they work, and how many hours they work. He also is a liaison with the hospital work station supervisors and attempts to resolve any difficulties; this provides him with the necessary information to be of service with the Neighborhood Youth Corps' payroll officers. With these various inputs, the intern can make recommendations to the Direct Search for Talent and Training Now for Tomorrow programs.

In addition, the Neighborhood Youth Corps provides its own college interns who are payroll officers and guidance counselors for the students. Since many of the interns are selected from among

students who were successful in the program in previous years and who are now enrolled in area colleges, they also are successful role models.

In sum, the students participating in the various programs are exposed to 8 to 10 college students who are alumni of the program, who are relatively successful in college, who are engaged in education related to health care and training, and who come from the same schools and neighborhoods as the participants. This exposure seems to be a necessary ingredient in the total picture.

To review, at the Johns Hopkins' Center for Allied Health Careers a group of ongoing programs involve high school students in entry-level health careers. The programs focus on curriculum design, "out-of-school" learning environments, providing introductory health care work experiences, developing marketable health care skills, providing college interns as administrative assistants and role models, handling the payroll function, and retaining high school dropouts. This is a multi-modal effort to bring economically disadvantaged but high-potential young black people into the health care system.

Critical Decisions

Numerous decisions must be made to determine the long-range direction of a substantial program. These decisions are critical, because once made they lead to subsequent steps establishing long-range interorganizational relationships. For example, if the goal of a program is similar to that of Johns Hopkins' program, then it would obviously be best to concentrate on affiliations with community colleges and State universities, many of which have programs in conjunction with State professional associations in the various health care specialties, such as physical therapy, radiology, or nursing. On the other hand, if the goal of a program is to identify and recruit future physicians, there would be greater emphasis on relationships with colleges featuring premed courses; with medical schools the operational mode would shift, the funding patterns would be different, and relationships with auxiliary support agencies would change. In the following discussion, we assume, for the sake of brevity, that the goals are similar to those of the Johns Hopkins' programs.

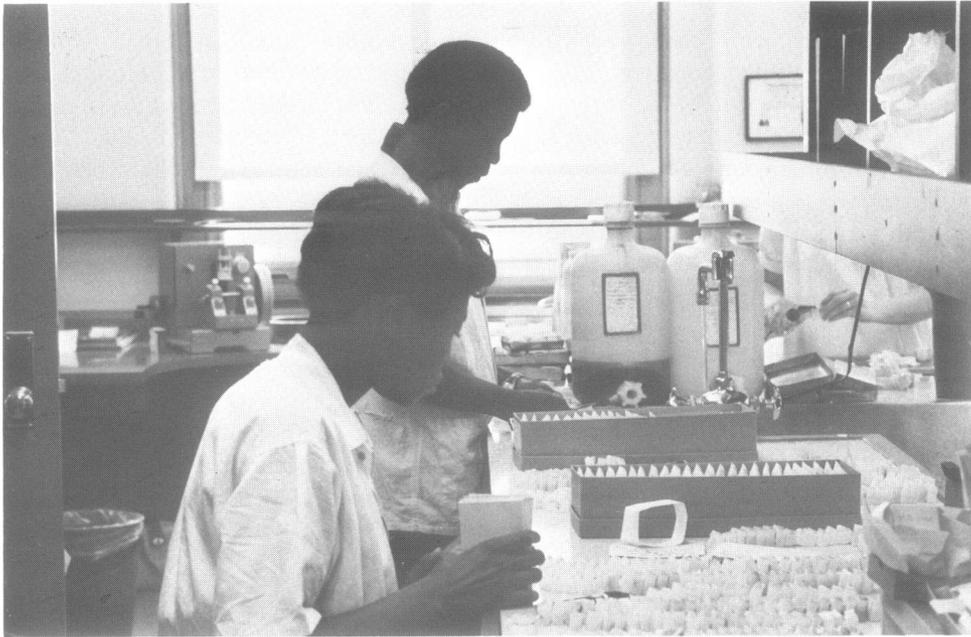
With similar goals, the identifiable decisions become procedural. Should the program be affiliated with a hospital or kept within a school situation? Should it train students in a specific skill or emphasize a survey of the spectrum of health careers? Should work-study stipends be

paid the student? If so, from what source? Should the program be for academic credit? How should the program be publicized? How should the students be recruited, screened, and placed? Where can one obtain funds and staff? What sort of teachers and administrators are best suited to the kind of program planned?

Perhaps the first two questions concerning school or hospital affiliation and survey or specific skill training can be answered best by illustration. The school system in New Haven, Conn., offers a program for seniors which allows them to take as an elective only one of the following: radiology, nursing, laboratory medicine, or laboratory animal care. The student retains his choice, which then becomes his field of specialization. The program does not incorporate on-the-job training in a hospital.

On the other hand, surveys of the health professions are often made superficially and quickly. At Johns Hopkins Hospital, there are 49 in-house, continuously operating, allied health training programs. Is it possible to introduce a student to 49 subprofessions during a 36-week school year? A solution to this dilemma seems to be a two-pronged curriculum design, including both survey and specific training. A solution was evolved at the UCLA Allied Health Professions Project, under the direction of Melvin E. Barlow, EdD. That solution is being incorporated into both the Dunbar Medi-School and the School Without a Building in Baltimore.

Briefly outlined, the students receive core experience which can be related to more than 250 allied health occupations over a 3-year period. During the 10th grade, the students have health-related classroom periods and coordinated field trips to Johns Hopkins Hospital to observe professional people in action. During the 11th grade, they receive more intensive exposure to the health care system, and they study selected case histories relating to common health problems. These case studies introduce the students to hospital occupations and tasks involved in patient care, which they subsequently observe through numerous field trips to the hospital. During the first month of their senior year, students in the Medi-School and School Without a Building programs rotate through four weekly work-study assignments in patient care, facilities support, technical services, and clinical services; from these, they select their final work-study station for their year-long, on-the-job training.



Processing surgical specimens that are embedded in paraffin in preparation for cutting and mounting in pathology laboratory

Ideally, our survey of health professions would expose students experientially to the major occupational areas, inform them of the required amounts of training necessary, and provide them with guidance and career counseling on an individual basis (perhaps through cooperating auxiliary agencies). The on-the-job training would give the student a more specific, in-depth exposure to one discipline and a marketable skill which could generate financial support during continued education in that discipline or a related field. It seems best to provide both a survey and on-the-job training in a specialty, with personal choice wherever possible.

At Johns Hopkins, as well as at other high school programs, the students report the hospital experience as the most interesting and exciting and as the greatest influence on future vocational choices. This suggests that hospital affiliation is most desirable, but the New Haven experience demonstrates that an in-school situation also works well. Either way, young people seem to "turn on" in health careers, possibly because of an apparent rise of interest in human welfare services.

Moreover, experience has taught us at Johns Hopkins that part-time, volunteer programs are good but frequently less effective than programs offered for credit from an academic institution. Work-study courses offered for credit, but without salary, are in turn less effective than courses with

an accompanying salary stipend paid to the student. No doubt this is due to the quasi-contractual employee-employer relationship which develops between the student and his supervisor.

Attendance improves noticeably when motivated by salary, and this improves continuity of supervision and training, hence performance. Classroom performance also improves when the individualized study, again quasi-contractual, relates to and prepares the student for his working situation. That is, students are encouraged to meet privately with teachers for individual instruction. If the student keeps his spare-time appointment and thus fulfills his part of the contract, he receives personalized job-related instruction.

Theoretically, the return to the quasi-contractual relationship between the student and the supervisor (apprenticeship) and the student and the teacher (preceptorship) may well be the direction taken by high school education in the future.

The use of behavioral objectives in instruction seems to increase the comprehension level of the students. Given an opportunity to perform tasks of equal responsibility as full-time hospital employees, students seem to perform well and to raise their self-image and aspiration levels in the process. In sum, academic credit together with work-study stipends seems to be an ideal combination for motivating students of poverty, inner-city, minority group background.

Affiliation with a hospital is desirable to expose the student to the exciting real-life situation, to the employee-employer relationship, and to reduce the costs of duplicating hospital facilities within a high school. Publicity, recruiting, screening, and placement are also important. How can a program with only 100–200 vacancies be publicized without raising the expectations of too many high school seniors? What sort of students should one seek? How can one best screen and place them? At Johns Hopkins, there was no set formula. Events created the evolution of a system.

As the program began to expand and the number of students and paperwork became too much for a limited staff, the Baltimore City Public Schools helped a great deal by sending questionnaires to the schools' job placement counselors seeking to identify interested and promising students. Perhaps 60–75 students at each school were identified by the science teachers and job counselors. Then, the administrators of four of the first five programs toured the high schools to explain the benefits of their programs. After being screened for financial qualification, the "general education" students were selected on the basis of attendance, recommendations, grades, and test scores.

The final qualifying group was then sent through the regular job screening and placement procedures at the Johns Hopkins Hospital personnel office. Each student was interviewed by his or her potential job supervisor for a particular work station at the hospital. If the initial matching of student and employer was not fortuitous, the student was then sent to other supervisors until a match was made. Less than 1 percent of the students chose not to remain in the program. Again, the benefits of hospital affiliation are clear.

Staffing and funding problems seem to be of a piece. Nearly all funds for administration of careers programs come through the National Vocational Education Act of 1968, and these are distributed through State departments of education. This means that most programs will be administered through existing school systems. A word of caution is in order here. It has been said that the best teachers in a health careers program are not education curriculum graduates with a smattering of medical technology, but rather medical technicians with a smattering of education courses. In either case, the problem of teacher certification looms large and should be anticipated. Similarly, the administrative staff of such a

program would ideally be made up of hospital-trained personnel. The Johns Hopkins' experience suggests that programs staffed with hospital-trained teachers and administrators, familiar with the operational needs of the health system, yield graduates better equipped to take their place as full-time employees or as students continuing their education toward a health profession. In this aspect, the New York and New Haven experiences concur.

Productivity

It is difficult, at best, to measure even quantifiable productivity. However, there are certain indices of soft data, that is, anecdotal reports, which suggest some overall improvement. One noteworthy index might be professional resistance—considerable initial skepticism about the Johns Hopkins program was expressed by medical professionals. Curiously, it softened over the years and became support heard as a shrill cry when the numbers of high school students were reduced owing to reduction in Federal funding. As the skepticism disappeared concerning the performance of returning medical corpsmen serving as physician's assistants, similarly high school students were eventually accepted as they demonstrated their ability to contribute at a mature and responsible level.

Many clinical unit chiefs within the complex expressed dependence on our summer work-study students as a vacation relief work force. With a standing staff of 4,000 employees in the Johns Hopkins Medical Institutions, the high school summer program of 400 students represents approximately 10 percent of the entire work force. Scheduled intelligently, this force became an integral part of the summer picture during the past 3 years. While the students may not have performed at 100 percent of the capacity of the staff they were relieving, nevertheless they performed adequately enough that their departure in the fall was vocally mourned by the various department chiefs. In addition, the administrators realized that the hospital benefited by the hundreds of thousands of dollars paid by the U.S. Department of Labor's Neighborhood Youth Corps for a vacation relief force.

Another index might be the secondary or social benefits of the program. For many Johns Hopkins' people, the program offered their first personal relationship with local community residents. This led to a gradual softening of Johns Hopkins-com-



Learning how plaster-embedded gauze is used in preparing casts

munity relations. The program also signaled Johns Hopkins' growing concern for education below the graduate level, which henceforth will be carried on in a proposed School of Health Services that will interdigitate with area community colleges and with high schools.

Initial cursory statistical investigations reveal that graduates of the programs go on to college or continuing education at the rate of 82 percent, as compared with a citywide and national rate of about 40 percent. This is more striking when one considers that the national and municipal rates are heavily weighted with "academic" or "college preparatory" curriculum students.

Another index might be the increased amount of interagency cooperation in these programs. This cooperation suggests a synergistic effect in which the total impact is greater than the mere sum of the individual parts.

The students received a marketable skill, a work-study stipend, and frequently letters of recommendation to colleges, while the hospital administration received a competently trained vacation relief force. The school system was able to publicize that it had answered the call for relevance in education, while it gained experience in new methods of teaching techniques and in new learning environments which emphasized relating on-the-job training to formal classroom work through quasi-contractual teacher-student relationships. The patients in the hospital benefited

because the vacation relief force had been trained in the methods of the Johns Hopkins Hospital, thus affording the patients continuity of care.

We believe that the double rate of college admissions, hiring of students by the hospital, expressions of support by no longer skeptical department chiefs, accounts of hard money saved by the administration, improved continuity of care for the patients, and improved Johns Hopkins-community relations are indices of improved productivity.

On the individual level, we experienced a number of exciting success stories. Though they are by no means proof of the absolute effectiveness of the program, they certainly suggest possible increases in productivity by the student. Subsequent research will confirm or deny our educated guesses about the impact of the programs. At the moment, we feel we have enough startling successes to be disproportionate to the usual grade distribution curves. This skewed success ratio is, we hypothesize, another effect of the program. In the absence of hard data, we offer some illustrative anecdotal reports.

TOM had planned to go to vocational high school to become an automobile mechanic. He was 14 years old when he came into the program. During the past 2 years he has been a laboratory assistant in hematology, where he performed general duties and sometimes assisted in minor surgery on animals. He has been accepted as a freshman at Johns Hopkins University and is earmarked for the Year One Medical School Program.



Student accompanies handicapped child to entertainment program at the hospital

DICK had difficulty finding a position and a person with whom he could have rapport. After three false starts, he was assigned to the orthopedic clinic of the radiology department. He did so well that he soon was coming in on weekends (without pay) to assist his overburdened supervisor. He has been admitted to the hospital's school of radiologic technology, and the school's director feels he has great promise.

HARRY seemed sullen and disinterested and was sent to numerous departments before he found a person with whom he established rapport. He improved markedly while working with psychiatric patients, growing more confident and outgoing. At a PTA meeting, his father reported to his supervisor, "Harry's attitude has changed 100 percent since he got into the program. He is more at ease and has made plans to go to college. We were afraid he would become a dropout."

PHYLLIS was assigned to the intensive care unit of the childlife department, a physically and emotionally taxing unit in which to work. Her supervisor resigned in February, and Phyllis was asked to direct the activities of the floor. In short, she became a floor supervisor. Never had a high school student been given so much responsibility in the department. Reports to date indicate the department is having difficulty finding a professional replacement for Phyllis.

Admittedly, these successes are merely anecdotal without any verification of the validity of the program's structure or operational mode. They do underline (a) the willingness and ability of high school students (chosen from among the ranks of general students, not overachievers) to rise to the challenge of a stimulating environment, resulting in the apparent improvement of both technical

and social skills and (b) the importance of the rapport-carrying quasi-contractual relationship between the student and teacher and the student and the work-station supervisor. In this we find the clearest signal for the direction in which beginning programs should proceed.

Results of Innovation

The results of the programs at the Johns Hopkins complex are already visible in interagency cooperation. The multiplicity of the programs suggests that they are already institutionalized in the city school system, that they will grow in numbers of participating students, that the schools will seek to develop similar relationships with other local hospitals and universities, and that this effort will stabilize as an educational mode within the city school system.

Because the Johns Hopkins complex draws upon a poverty population for its students, criteria for selection are financial need first and academic promise second. It seems that the nation will soon recognize the applicability of this educational innovation to other sectors of the population. To this end, new and more varied funding mechanisms can be expected. For example, with the President's recognition of the national need for 50,000 additional physicians, some provisions will probably be made also for identifying and recruiting, training, and placing young people in allied health professions.

Municipal school systems, particularly those which enjoy good relationships with municipal health systems, should prepare to develop programs which will enable them to participate in this anticipated national effort. With the emphasis on career education and with health careers having high priority in "turning on" the young, health careers programs in high schools seem to be one method for bringing relevance back to education.

How to Do It

If one were to begin a high school health careers program, the necessary lead time would be 18 to 24 months for curriculum design, planning facilities, scheduling, bringing together the participating agencies, and recruiting personnel. Fortunately, much of the pioneer design work has been done by various ongoing programs which will share their experiences with newcomers. Baltimore's Dunbar High School, Los Angeles' program with UCLA, the program in New Haven, the Hahnemann and University of Pennsylvania Medical Schools in Philadelphia, and the Mount Sinai Hospital project in New York have worked on various aspects of the effort. One might expect to shorten by half the planning and preparation stage by developing custom-tailored, localized variations on these successful programs.

Since any such program will most likely be related to a school system, the academic year will become the basic unit of time. Implementation of a program will be geared toward the yearly graduating class, and evaluation and revision will be best carried out on a yearly basis. At Johns Hopkins we grew haphazardly as various cooperating agencies took part. Although there were no pre-established stages, we followed standard procedure as a natural sequence. Perhaps it is best to plan for it in advance. Laboring the obvious, it seems likely to expect the typical time frame to be as follows: first year—planning, scheduling, gathering resources and personnel, securing interagency cooperation, and recruiting students; second year—operation of the program, pre- and post-tests and performance evaluation of the graduating class, planning revisions, and recruiting the next class; third year—implementation of revisions, continuing evaluation and revision, recruiting the next class.

More specifically, in operations research a wide repertoire of techniques (Gantt charts, PERT diagrams, critical path flow) has been devised for planning, starting, implementing, and evaluating

programs as varied as moon shots and nurse staffing schedules. Some of their broadest suggestions can be applied here, though it is unwise to anticipate that any event will go perfectly according to its time table. More than likely, some items will run concurrently or in inverted sequences. Bearing that in mind, the general outline for any project might be—

1. Study existing situation
2. State objectives and goals
3. List alternative strategies for achieving goals
4. Select "optimal" alternative
5. Implement and evaluate.

In beginning a health sciences careers program at the high school level, it is best to immediately involve the community which the program will serve in the planning and decision-making process. Community representation should cover the whole spectrum, from local area parents and students to those in key political and economic positions. It may require designating the assemblage as an incorporated nonprofit educational institution so it can receive grants. Ideally, the initiative will pass from the hospital to the community early in the planning stage. Professional input can be exercised with minimum resistance through the consultant's role into which hospital personnel are usually thrust, since it is upon their expertise the success of the program will come to depend.

Once the group has been established, it is best to start with stage 1; that is, take an inventory of health resources which might be utilized, such as existing hospital training programs, maximum number of work-study job slots available, manpower needs of the community health system, pertinent legislation, funds, facilities available for such a program, and potential teaching and administrative staff. Similarly, an inventory should be taken of educational and community resources. Are there means for identification, recruitment, screening, and placement of students? Is there a student work-study stipend funding mechanism? Is there a college counseling and financial aid agency? A college intern program?

Stage 2—statement of objectives and goals—is perhaps the trickiest. Some organizations never state explicit goals, while other organizations state goals and hold to them. The Johns Hopkins' experience suggests that a clear statement of goals, arrived at as cooperatively as possible by all contributing agencies, is imperative. It cannot be too heavily stressed that consensus must be reached in advance, to avoid subsequent squabbling and un-



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dermining of the program due to differing interpretations or emphases of unformalized goals.

The statement of goals was formalized in Baltimore in 1969 by the Dunbar High School Charette. This was a 2-week series of all-day meetings to deliberate the direction of the new programs. Attending the meeting were representatives of the State and city governments, the educational system, the East Baltimore community, the State hospital association, Blue Cross, Blue Shield, area and community colleges, labor unions, and the Johns Hopkins' community.

At the charette many subtle issues were repeatedly debated. Similarly, great care should be taken to prescribe goals, objectives, target dates, and priorities in a budding program; for example, primacy of training physicians or allied health professionals and primacy of developing jobs or career ladder lattices. Other considerations might be the optimal number of students that the program can accommodate, realistic expectancies of

the impact of the program on the careers of the students, and the health care of the community. The answers to these questions will shift from time to time as conditions change and the program advances. A mechanism for changing these explicit goals by group process should also be provided.

At this point, after a statement of goals, the critical decisions outlined can be approached and stage 3, or listing alternative strategies for achieving goals, can begin. For example, after taking inventory of community resources it may be equally feasible to develop programs which operate either in a high school or in a hospital. However, study of alternative strategies shows that getting the students to the hospital is difficult. The options open might be to bus a small number of students to a participating unit where they can gain experience in the actual hospital setting or to place a larger number in a simulated hospital setting within a school.

Such a choice could then be referred back to the larger group for a decision. This would constitute stage 4, or selecting the optimal alternatives. Stage 5, implementation and evaluation, could be carried out as suggested.

Our recipe for success, then, would look something like this.

1. Convene a group of interested parties—hospital, university, school system, government, supporting service agencies, prominent community personalities, and political leaders. Establish an identity and determine if it is necessary to incorporate under local law. Develop prestigious affiliations through honorary memberships, perhaps listed on stationery. Discuss the possibilities of such a program, its planning, funding, goals, and possible impact. Assign inventory tasks to each person to be finished by the next meeting.

2. Reconvene the group, and have a list of community resources available to the program. Based on a realistic assessment of available resources, attempt to state goals, objectives, targets, and priorities. Remember to define these terms to avoid confusion. Goals are usually a statement of the desired end state, independent of time—the goal of the program is better health career opportunities. Objectives are usually quantified manifestations of goals—we seek to produce annually 100 students better prepared to function satisfactorily as employees in the health care system. Targets are quantified manifestations of goals in time—we sought to recruit 100 students by June 1, 1972. Priorities imply a hierarchy of goals—we seek to produce both physicians and allied health professionals, but as we also seek to provide the greatest good to the greatest number, we shall emphasize allied health professionals.

3. Create working committees or, working as a committee of the whole, construct alternative strategies (and their permutations and combinations) for achieving the specified goals. At Johns Hopkins we chose both survey and specific skill training, hospital-based programs for the economically underprivileged, with focus on producing a highly mobile allied health professional who could maneuver within the health care ladder lattice as his skills and interests developed. Other models could have been constructed similar to that of the Hahnemann Medical School (which emphasizes identifying and recruiting future physicians) or the New Haven School System (which keeps its program contained within the high schools, simulating

laboratories and X-ray facilities). One may construct an alternative strategy just right for his community from such a matrix:

Middle class or economically underprivileged, or both
Survey of professions or training in specific skill, or both
Hospital affiliation or schoolroom simulation of hospital, or both
Development of physicians or allied health professionals, or both
Development of health jobs or health career ladder lattice, or both
Quantity or quality, or both
Hospital-trained teachers or educational majors with some science, or both
Volunteer basis or work-study stipends, or both

4. Choose a design strategy and make a public statement of it, investing the statement with as much dignity as possible. This will make the program a high-prestige venture for both students and educators.

5. Recruit director and staff (preferably from among hospital personnel) through methods and criteria established by the group.

6. Develop curriculum. Establish working relationships between all the various cooperating agencies. Define areas of responsibility. Establish tasks and target dates; that is, college intern program in operation by September 1.

7. Recruit students in the spring of the year the program is expected to go into operation, according to criteria established by the group.

8. Begin operations in the fall, and monitor the students closely during the first 6 to 8 weeks. Anticipate a high need for counseling and guidance during the job-placement period; that is, when matching the student to his on-the-job training assignment.

9. Prepare students for SAT exams by having special enrichment and preparation classes conducted by your college interns.

10. Develop a comprehensive recordkeeping system which will enable one to assess the impact of the program on each student's educational and economic progress over time.

11. Seek access to the recordkeeping system of the school system in the community for use as a data base for future comparisons.

Extrapolating from the success in Baltimore, Los Angeles, New Haven, New York, and Philadelphia, 75–90 percent of the students should become employed in, or go on to further study toward, professions in the health care system. That has been the Johns Hopkins' experience.